

Appl. No. 10/710,939
Amdt. dated November 17, 2005
Reply to Office Action of October 20, 2005

AMENDMENTS TO THE CLAIMS:

Please cancel claims 28 and 29 without prejudice or disclaimer.

Please amend claims 1-3, 5, 11, 13, 16-18, 20, 23-27, 31, 37, 39, 41, 44, 47-49, 51, 57, 59, 62-64, 66, and 69 as follows:

LISTING OF CLAIMS:

1. (Currently Amended) A multiphase compressing air assembly for supplying compressed air to a system, said assembly comprising:

a first compressor drivingly connectable to a power source shaft and operable to compress air for the system,

said first compressor including a first inlet, a spaced first outlet, and a first rotatable impeller fluidly between the first inlet and first outlet to compress air;

a second compressor drivingly connectable to the power source shaft and operable to compress air for the system,

said second compressor including a second inlet, a spaced second outlet, and a second rotatable impeller fluidly between the second inlet and second outlet to compress air;

and

a fluid flow control assembly fluidly intercommunicating the compressors so that the compressors cooperatively provide compressed air to the system in a number of

Appl. No. 10/710,939
Amdt. dated November 17, 2005
Reply to Office Action of October 20, 2005

operating phases, including a first phase in which at least some compressed air from the first outlet is supplied to the second inlet and a second phase in which at least some compressed air from the first and second outlets is supplied to the system without passing through the other compressor,

said first and second compressors being drivingly connectable to the power source shaft wherein both of the impellers are rotated continuously by the power source shaft and at a substantially constant relative speed to the power source shaft speed during the operating phases of the compressors.

2. (Currently Amended) The assembly as claimed in claim 1; and
a drive assembly operable to drivingly connect the compressors to the power source shaft so that each of the compressors operates continuously with operation of the power source.

3. (Currently Amended) The assembly as claimed in claim 2,
said first and second impellers being rotatable, each being operable to compress air for the system when rotated,
said first and second compressors including a transmission drivingly connecting the impellers to the drive assembly,

Appl. No. 10/710,939
Amtd. dated November 17, 2005
Reply to Office Action of October 20, 2005

said transmission cooperating with the drive assembly to maintain rotation of the impellers
at ~~the~~ a substantially constant speed ratio relative to operation of the power source.

4. (Original) The assembly as claimed in claim 3,
said transmission including a plurality of intermeshing gears with at least one of said gears
being common to both compressors.

5. (Currently Amended) ~~The assembly as claimed in claim 4;~~ A multiphase
compressing air assembly for supplying compressed air to a system, said assembly comprising:
a first compressor drivingly connectable to a power source and operable to compress air for
the system,
said first compressor including a first inlet, a spaced first outlet, and a first impeller fluidly
between the first inlet and first outlet to compress air;
a second compressor drivingly connectable to the power source and operable to compress air
for the system,
said second compressor including a second inlet, a spaced second outlet, and a second
impeller fluidly between the second inlet and second outlet to compress air;
a fluid flow control assembly fluidly intercommunicating the compressors so that the
compressors cooperatively provide compressed air to the system in a number of
operating phases, including a first phase in which at least some compressed air from

Appl. No. 10/710,939
Amdt. dated November 17, 2005
Reply to Office Action of October 20, 2005

the first outlet is supplied to the second inlet and a second phase in which at least some compressed air from the first and second outlets is supplied to the system without passing through the other compressor; and
a drive assembly operable to drivingly connect the compressors to the power source so that each of the compressors operates continuously with operation of the power source, said first and second impellers being rotatable, each being operable to compress air for the system when rotated,
said first and second compressors including a transmission drivingly connecting the impellers to the drive assembly,
said transmission cooperating with the drive assembly to maintain rotation of the impellers at a substantially constant ratio relative to operation of the power source,
said transmission including a plurality of intermeshing gears with at least one of said gears being common to both compressors,
said transmission including a common rotatable transmission shaft coupled to said common gear,
said drive assembly including an endless element entraining at least a portion of said common shaft and being operable to entrain at least a portion of the power source.

6. (Original) The assembly as claimed in claim 1,

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

said fluid flow control assembly fluidly intercommunicating the compressors so that in all operating phases both compressors compress at least some air for the system whenever the power source is operating.

7. (Original) The assembly as claimed in claim 6,

said fluid flow control assembly being operable to fluidly intercommunicate the compressors with the system so that in all operating phases substantially all of the air compressed by each of the compressors is delivered to the system.

8. (Original) The assembly as claimed in claim 1,

said first phase including a series phase in which substantially all compressed air from the first outlet is supplied to the second inlet.

9. (Original) The assembly as claimed in claim 8,

said second phase including a parallel phase in which substantially all compressed air from the first and second outlets is supplied directly to the system.

10. (Original) The assembly as claimed in claim 9,

said fluid flow control assembly being configured to switch operation of the compressors from the series phase to the parallel phase in response to a predetermined condition.

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

11. (Currently Amended) ~~The assembly as claimed in claim 10;~~ A multiphase compressing air assembly for supplying compressed air to a system, said assembly comprising:
a first compressor drivingly connectable to a power source and operable to compress air for the system,
said first compressor including a first inlet, a spaced first outlet, and a first impeller fluidly between the first inlet and first outlet to compress air;
a second compressor drivingly connectable to the power source and operable to compress air for the system,
said second compressor including a second inlet, a spaced second outlet, and a second impeller fluidly between the second inlet and second outlet to compress air; and
a fluid flow control assembly fluidly intercommunicating the compressors so that the compressors cooperatively provide compressed air to the system in a number of operating phases, including a first phase in which at least some compressed air from the first outlet is supplied to the second inlet and a second phase in which at least some compressed air from the first and second outlets is supplied to the system without passing through the other compressor,
said first phase including a series phase in which substantially all compressed air from the first outlet is supplied to the second inlet,
said second phase including a parallel phase in which substantially all compressed air from the first and second outlets is supplied directly to the system.

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

said fluid flow control assembly being configured to switch operation of the compressors
from the series phase to the parallel phase in response to a predetermined condition,
said predetermined condition being a decrease ~~an increase~~ in pressure in the system
downstream of the first and second compressors.

12. (Original) The assembly as claimed in claim 11,
said fluid flow control assembly being configured to switch operation of the compressors
from the parallel phase to the series phase in response to a second predetermined
condition.

13. (Currently Amended) The assembly as claimed in claim 12,
said predetermined condition being ~~a decrease~~ an increase in pressure in the system
downstream of the first and second compressors.

14. (Original) The assembly as claimed in claim 1; and
a case presenting a compression chamber and a transmission chamber,
said first and second compressors being at least partially housed within said compression
chamber.

15. (Original) The assembly as claimed in claim 1,

Appl. No. 10/710,939
Amdt. dated November 17, 2005
Reply to Office Action of October 20, 2005

said fluid flow control assembly including a passageway fluidly communicating said first outlet and said second inlet,

said fluid flow control assembly further including a first valve disposed along said passageway for controlling the flow of compressed air there through.

16. (Currently Amended) ~~The assembly as claimed in claim 15;~~ A multiphase compressing air assembly for supplying compressed air to a system, said assembly comprising:

a first compressor drivingly connectable to a power source and operable to compress air for the system,

said first compressor including a first inlet, a spaced first outlet, and a first impeller fluidly between the first inlet and first outlet to compress air;

a second compressor drivingly connectable to the power source and operable to compress air for the system,

said second compressor including a second inlet, a spaced second outlet, and a second impeller fluidly between the second inlet and second outlet to compress air; and

a fluid flow control assembly fluidly intercommunicating the compressors so that the compressors cooperatively provide compressed air to the system in a number of operating phases, including a first phase in which at least some compressed air from the first outlet is supplied to the second inlet and a second phase in which at least

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

some compressed air from the first and second outlets is supplied to the system
without passing through the other compressor.

said fluid flow control assembly including a passageway fluidly communicating said first
outlet and said second inlet.

said fluid flow control assembly further including a first valve disposed along said
passageway for controlling the flow of compressed air there through.

said first valve shiftable between an open position wherein compressed air can is permitted
to flow through said passageway and a closed position wherein compressed air is
prevented from flowing through said passageway.

17. (Currently Amended) ~~The assembly as claimed in claim 15;~~ A multiphase
compressing air assembly for supplying compressed air to a system, said assembly comprising:

a first compressor drivingly connectable to a power source and operable to compress air for
the system.

said first compressor including a first inlet, a spaced first outlet, and a first impeller fluidly
between the first inlet and first outlet to compress air;

a second compressor drivingly connectable to the power source and operable to compress air
for the system.

said second compressor including a second inlet, a spaced second outlet, and a second
impeller fluidly between the second inlet and second outlet to compress air; and

Appl. No. 10/710,939

Amtd. dated November 17, 2005

Reply to Office Action of October 20, 2005

a fluid flow control assembly fluidly intercommunicating the compressors so that the compressors cooperatively provide compressed air to the system in a number of operating phases, including a first phase in which at least some compressed air from the first outlet is supplied to the second inlet and a second phase in which at least some compressed air from the first and second outlets is supplied to the system without passing through the other compressor.

said fluid flow control assembly including a passageway fluidly communicating said first outlet and said second inlet,

said fluid flow control assembly further including a first valve disposed along said passageway for controlling the flow of compressed air there through,

said fluid flow control assembly including an additional passageway in fluid communication with said first outlet and operable to be in fluid communication with the system,

said fluid flow control assembly further including a second valve disposed along said additional passageway downstream of said first-mentioned passageway for controlling the flow of compressed air through said additional passageway.

18. (Currently Amended) The assembly as claimed in claim 17,

said second valve shiftable between an open position wherein compressed air can is permitted to flow through said additional passageway and a closed position wherein compressed air is prevented from flowing through said additional passageway.

Appl. No. 10/710,939
Amtd. dated November 17, 2005
Reply to Office Action of October 20, 2005

19. (Original) The assembly as claimed in claim 17,
said fluid flow control assembly including a second additional passageway in fluid
communication with said second inlet,
said fluid flow control assembly further including a third valve disposed along said second
additional passageway upstream of said first-mentioned passageway for controlling
the flow of air through said second additional passageway.

20. (Currently Amended) The assembly as claimed in claim 19,
said third valve shiftable between an open position wherein air ~~can~~ is permitted to flow
through said second additional passageway and a closed position wherein air is
prevented from flowing through said second additional passageway.

21. (Original) The assembly as claimed in claim 19; and
a case presenting a compression chamber and a transmission chamber,
said first and second compressors and said fluid flow control assembly being at least partially
housed within said compression chamber,
said compression chamber presenting a case inlet in fluid communication with the
atmosphere.

22. (Original) The assembly as claimed in claim 21,

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

said fluid flow control assembly including a third additional passageway fluidly communicating the case inlet with said first inlet and fluidly communicating the case inlet with said second additional passageway,

said fluid flow control assembly further including a fourth valve disposed along said third additional passageway for controlling the flow of air there through.

23. (Currently Amended) The assembly as claimed in claim 22,

said fourth valve shiftable between an open position wherein air can is permitted to flow through said third additional passageway and a partially closed position wherein at least some air is prevented from flowing through said third additional passageway.

24. (Currently Amended) A method of supplying compressed air to a system, said method comprising the steps of:

- (a) driving a first compressor ~~off of~~ by a power source shaft to compress air;
- (b) driving a second compressor ~~off of~~ by the power source shaft to compress air;
- (c) operating the compressors at least partially in series so that at least some air that is compressed by the first compressor is further compressed by the second compressor and then supplied to the system; and
- (d) operating the compressors at least partially in parallel so that at least a portion of air is compressed by the first compressor and at least another portion of air is

Appl. No. 10/710,939
Amdt. dated November 17, 2005
Reply to Office Action of October 20, 2005

compressed by the second compressor and the at least a portion and at least another portion of compressed air are supplied to the system without passing through the other compressor.

said driving steps of (a) and (b) each being performed so that both compressors are continuously operated by the power source at a substantially constant relative speed to the power source shaft speed during the operating steps of (c) and (d).

25. (Currently Amended) ~~The method as claimed in claim 24;~~ A method of supplying compressed air to a system, said method comprising the steps of:

- (a) driving a first compressor off of a power source to compress air;
- (b) driving a second compressor off of the power source to compress air;
- (c) operating the compressors at least partially in series so that at least some air that is compressed by the first compressor is further compressed by the second compressor and then supplied to the system; and
- (d) operating the compressors at least partially in parallel so that at least a portion of air is compressed by the first compressor and at least another portion of air is compressed by the second compressor and the at least a portion and at least another portion of compressed air are supplied to the system without passing through the other compressor.

Appl. No. 10/710,939
Amdt. dated November 17, 2005
Reply to Office Action of October 20, 2005

step (d) being performed after step (c) so that operation of the compressors phases from at least partially in series to at least partially in parallel in response to a predetermined condition,

said predetermined condition comprising a decrease ~~an increase~~ in pressure in the system downstream of the first and second compressors.

26. (Currently Amended) The method as claimed in claim 24, step (d) including the step of switching operation of the compressors to substantially fully parallel in response to a predetermined condition so that at least a portion of air is compressed by the first ~~compressors~~ compressor and at least another portion of air is compressed by the second compressor and the at least a portion and at least another portion of compressed air are supplied to the system without passing through the other compressor wherein said at least a portion and said at least another portion of compressed air comprise substantially all compressed air supplied to the system.

27. (Currently Amended) ~~The method as claimed in claim 26;~~ A method of supplying compressed air to a system, said method comprising the steps of:

- (a) driving a first compressor off of a power source to compress air;
- (b) driving a second compressor off of the power source to compress air;

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

(c) operating the compressors at least partially in series so that at least some air that is compressed by the first compressor is further compressed by the second compressor and then supplied to the system; and

(d) operating the compressors at least partially in parallel so that at least a portion of air is compressed by the first compressor and at least another portion of air is compressed by the second compressor and the at least a portion and at least another portion of compressed air are supplied to the system without passing through the other compressor.

step (d) including the step of switching operation of the compressors to substantially fully parallel in response to a predetermined condition so that at least a portion of air is compressed by the first compressors and at least another portion of air is compressed by the second compressor and the at least a portion and at least another portion of compressed air are supplied to the system without passing through the other compressor wherein said at least a portion and said at least another portion of compressed air comprise substantially all compressed air supplied to the system.

said predetermined condition an increase being a decrease in pressure in the system downstream of the first and second compressors.

28. (Canceled)

Appl. No. 10/710,939
Amtd. dated November 17, 2005
Reply to Office Action of October 20, 2005

29. (Canceled)

30. (Original) The method as claimed in claim 28,
steps (a) and (b) including the common step of intermeshing a common gear between the
compressors.

31. (Currently Amended) ~~The method as claimed in claim 30;~~ A method of
supplying compressed air to a system, said method comprising the steps of:

- (a) driving a first compressor off of a power source to compress air;
- (b) driving a second compressor off of the power source to compress air;
- (c) operating the compressors at least partially in series so that at least some air that is
compressed by the first compressor is further compressed by the second compressor
and then supplied to the system; and
- (d) operating the compressors at least partially in parallel so that at least a portion of air
is compressed by the first compressor and at least another portion of air is
compressed by the second compressor and the at least a portion and at least another
portion of compressed air are supplied to the system without passing through the
other compressor.

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

steps (a) and (b) each including the step of drivingly connecting the compressors to the power source so that each of the compressors operates continuously with operation of the power source.

steps (a) and (b) including the common step of intermeshing a common gear between the compressors.

steps (a) and (b) further including the common steps of entraining an endless element around at least a portion of the power source and driving the common gear at least in part with the endless element.

32. (Original) The method as claimed in claim 24,
steps (c) and (d) each including the step of operating both compressors so that each compressor compresses at least some air that is supplied to the system whenever the power source is operating.

33. (Original) The method as claimed in claim 32,
steps (c) and (d) each further including the step of delivering substantially all of the air compressed by the compressors to the system.

34. (Original) The method as claimed in claim 24,

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

step (c) including the step of operating the compressors substantially fully in series so that substantially all air that is compressed by the first compressor is further compressed by the second compressor and then supplied to the system.

35. (Original) The method as claimed in claim 24; and

(e) housing both compressors substantially within a case.

36. (Original) The method as claimed in claim 24; and

(e) intercommunicating the first and second compressors and the system,

step (e) including the steps of fluidly communicating the first and second compressors with a serial passageway and disposing a first valve along the serial passageway for controlling the flow of compressed air there through.

37. (Currently Amended) ~~The method as claimed in claim 36,~~ A method of supplying compressed air to a system, said method comprising the steps of:

(a) driving a first compressor off of a power source to compress air;

(b) driving a second compressor off of the power source to compress air;

(c) operating the compressors at least partially in series so that at least some air that is compressed by the first compressor is further compressed by the second compressor and then supplied to the system;

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

(d) operating the compressors at least partially in parallel so that at least a portion of air is compressed by the first compressor and at least another portion of air is compressed by the second compressor and the at least a portion and at least another portion of compressed air are supplied to the system without passing through the other compressor; and

(e) intercommunicating the first and second compressors and the system,

step (e) including the steps of fluidly communicating the first and second compressors with a serial passageway and disposing a first valve along the serial passageway for controlling the flow of compressed air there through,

step (c) including the step of shifting the first valve into an open position wherein compressed air ~~can~~ is permitted to flow through said serial passageway.

38. (Original) The method as claimed in claim 36,

step (d) including the step of shifting the first valve into a closed position wherein compressed air is prevented from flowing through said serial passageway.

39. (Currently Amended) ~~The method as claimed in claim 36,~~ A method of supplying compressed air to a system, said method comprising the steps of:

(a) driving a first compressor off of a power source to compress air;

(b) driving a second compressor off of the power source to compress air;

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

- (c) operating the compressors at least partially in series so that at least some air that is compressed by the first compressor is further compressed by the second compressor and then supplied to the system;
- (d) operating the compressors at least partially in parallel so that at least a portion of air is compressed by the first compressor and at least another portion of air is compressed by the second compressor and the at least a portion and at least another portion of compressed air are supplied to the system without passing through the other compressor; and
- (e) intercommunicating the first and second compressors and the system,
step (e) including the steps of fluidly communicating the first and second compressors with a serial passageway and disposing a first valve along the serial passageway for controlling the flow of compressed air there through,
- step (e) including the steps of fluidly communicating the first compressor and the system with an additional passageway and disposing a second valve along the additional passageway for controlling the flow of compressed air there through.

40. (Original) The method as claimed in claim 39,

- step (c) including the step of shifting the second valve into a closed position wherein compressed air is prevented from flowing through said additional passageway.

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

41. (Currently Amended) The method as claimed in claim 39,
step (d) including the step of shifting the second valve into an open position wherein
compressed air ~~can~~ is permitted to flow through said additional passageway.

42. (Original) The method as claimed in claim 39,
step (e) including the steps of fluidly communicating the second compressor and the
atmosphere with a parallel passageway and disposing a third valve along the parallel
passageway for controlling the flow of air there through.

43. (Original) The method as claimed in claim 42,
step (c) including the step of shifting the third valve into a closed position wherein air is
prevented from flowing through said parallel passageway.

44. (Currently Amended) The method as claimed in claim 43,
step (d) including the step of shifting the third valve into an open position wherein air ~~can~~
is permitted to flow through the parallel passageway.

45. (Original) The method as claimed in claim 42,

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

step (e) including the step of fluidly communicating the atmosphere, the first compressor, and the parallel passageway with an inlet passageway and disposing a fourth valve along said inlet passageway for controlling the flow of air there through.

46. (Original) The method as claimed in claim 45; and

(f) shifting the fourth valve into a partially closed position wherein at least some air is prevented from flowing through said inlet passageway.

47. (Currently Amended) In a pneumatic conveyor including tubing and a power source shaft, an improved centrifugal air compressing system comprising:

a first compressor drivingly connected to the power source shaft for compressing air for the tubing,

said first compressor including a first inlet, a spaced first outlet, and a first rotatable impeller fluidly between the first inlet and first outlet to compress air;

a second compressor drivingly connected to the power source shaft for compressing air for the tubing,

said second compressor including a second inlet, a spaced second outlet, and a second rotatable impeller fluidly between the second inlet and second outlet to compress air; and

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

a fluid flow control assembly fluidly intercommunicating the compressors so that the compressors cooperatively provide compressed air to the tubing in a number of operating phases, including a first phase in which at least some compressed air from the first outlet is supplied to the second inlet and a second phase in which at least some compressed air from the first and second outlets is supplied to the tubing without passing through the other compressor,

said first and second compressors being drivingly connected to the power source shaft wherein both of the impellers are rotated continuously by the power source shaft and at a substantially constant relative speed to the power source shaft speed during the operating phases of the compressors.

48. (Currently Amended) In a pneumatic conveyor as claimed in claim 47; and a drive assembly drivingly connecting the compressors to the power source so that each of the compressors operates continuously with operation of the power source.

49. (Currently Amended) In a pneumatic conveyor as claimed in claim 48, said first and second impellers being rotatable to compress air for the tubing when rotated, said first and second compressors including a transmission drivingly connecting the impellers to the drive assembly,

Appl. No. 10/710,939
Amdt. dated November 17, 2005
Reply to Office Action of October 20, 2005

said transmission cooperating with the drive assembly to maintain rotation of the impellers
at the a substantially constant speed ratio relative to the operation of the power
source.

50. (Original) In a pneumatic conveyor as claimed in claim 49,
said transmission including a plurality of intermeshing gears with at least one of said gears
being common to both compressors.

51. (Currently Amended) ~~In a pneumatic conveyor as claimed in claim 50;~~ In a
pneumatic conveyor including tubing and a power source, an improved centrifugal air compressing
system comprising:

a first compressor drivingly connected to the power source for compressing air for the
tubing,

said first compressor including a first inlet, a spaced first outlet, and a first impeller fluidly
between the first inlet and first outlet to compress air;

a second compressor drivingly connected to the power source for compressing air for the
tubing,

said second compressor including a second inlet, a spaced second outlet, and a second
impeller fluidly between the second inlet and second outlet to compress air;

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

a fluid flow control assembly fluidly intercommunicating the compressors so that the compressors cooperatively provide compressed air to the tubing in a number of operating phases, including a first phase in which at least some compressed air from the first outlet is supplied to the second inlet and a second phase in which at least some compressed air from the first and second outlets is supplied to the tubing without passing through the other compressor; and

a drive assembly drivingly connecting the compressors to the power source so that each of the compressors operates continuously with operation of the power source,

said first and second impellers being rotatable to compress air for the tubing when rotated,

said first and second compressors including a transmission drivingly connecting the impellers to the drive assembly,

said transmission cooperating with the drive assembly to maintain rotation of the impellers at a substantially constant ratio relative to the operation of the power source,

said transmission including a plurality of intermeshing gears with at least one of said gears being common to both compressors,

said transmission including a common rotatable transmission shaft coupled to said common gear,

said drive assembly including an endless element entraining at least a portion of said common shaft and at least a portion of the power source.

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

52. (Original) In a pneumatic conveyor as claimed in claim 47,
said fluid flow control assembly fluidly intercommunicating the compressors so that in all
operating phases both compressors compress at least some air for the tubing
whenever the power source is operating.

53. (Original) In a pneumatic conveyor as claimed in claim 52,
said fluid flow control assembly being operable to fluidly intercommunicate the compressors
with the tubing so that in all operating phases substantially all of the air compressed
by each of the compressors is delivered to the tubing.

54. (Original) In a pneumatic conveyor as claimed in claim 47,
said first phase including a series phase in which substantially all compressed air from the
first outlet is supplied to the second inlet.

55. (Original) In a pneumatic conveyor as claimed in claim 54,
said second phase including a parallel phase in which substantially all compressed air from
the first and second outlets is supplied directly to the tubing.

56. (Original) In a pneumatic conveyor as claimed in claim 55,

Appl. No. 10/710,939
Amdt. dated November 17, 2005
Reply to Office Action of October 20, 2005

said fluid flow control assembly being configured to switch operation of the compressors from the series phase to the parallel phase in response to a predetermined condition.

57. (Currently Amended) ~~In a pneumatic conveyor as claimed in claim 56, In a pneumatic conveyor including tubing and a power source, an improved centrifugal air compressing system comprising:~~

a first compressor drivingly connected to the power source for compressing air for the tubing,

said first compressor including a first inlet, a spaced first outlet, and a first impeller fluidly between the first inlet and first outlet to compress air;

a second compressor drivingly connected to the power source for compressing air for the tubing,

said second compressor including a second inlet, a spaced second outlet, and a second impeller fluidly between the second inlet and second outlet to compress air; and

a fluid flow control assembly fluidly intercommunicating the compressors so that the compressors cooperatively provide compressed air to the tubing in a number of operating phases, including a first phase in which at least some compressed air from the first outlet is supplied to the second inlet and a second phase in which at least some compressed air from the first and second outlets is supplied to the tubing without passing through the other compressor,

Appl. No. 10/710,939

Amtd. dated November 17, 2005

Reply to Office Action of October 20, 2005

said first phase including a series phase in which substantially all compressed air from the first outlet is supplied to the second inlet,

said second phase including a parallel phase in which substantially all compressed air from the first and second outlets is supplied directly to the tubing,

said fluid flow control assembly being configured to switch operation of the compressors from the series phase to the parallel phase in response to a predetermined condition,

said predetermined condition being a decrease ~~an increase~~ in pressure in the tubing downstream of the first and second compressors.

58. (Original) In a pneumatic conveyor as claimed in claim 57,
said fluid flow control assembly being configured to switch operation of the compressors from the parallel phase to the series phase in response to a second predetermined condition.

59. (Currently Amended) In a pneumatic conveyor as claimed in claim 58,
said predetermined condition being an increase ~~a decrease~~ in pressure in the tubing downstream of the first and second compressors.

60. (Original) In a pneumatic conveyor as claimed in claim 47; and
a case presenting a compression chamber and a transmission chamber,

Appl. No. 10/710,939
Amdt. dated November 17, 2005
Reply to Office Action of October 20, 2005

said first and second compressors being at least partially housed within said compression chamber.

61. (Original) In a pneumatic conveyor as claimed in claim 47,
said fluid flow control assembly including a passageway fluidly communicating said first outlet and said second inlet,
said fluid flow control assembly further including a first valve disposed along said passageway for controlling the flow of compressed air there through.

62. (Currently Amended) ~~In a pneumatic conveyor as claimed in claim 61, and~~
In a pneumatic conveyor including tubing and a power source, an improved centrifugal air compressing system comprising:

a first compressor drivingly connected to the power source for compressing air for the tubing,

said first compressor including a first inlet, a spaced first outlet, and a first impeller fluidly between the first inlet and first outlet to compress air;

a second compressor drivingly connected to the power source for compressing air for the tubing,

said second compressor including a second inlet, a spaced second outlet, and a second impeller fluidly between the second inlet and second outlet to compress air; and

Appl. No. 10/710,939

Arndt, dated November 17, 2005

Reply to Office Action of October 20, 2005

a fluid flow control assembly fluidly intercommunicating the compressors so that the compressors cooperatively provide compressed air to the tubing in a number of operating phases, including a first phase in which at least some compressed air from the first outlet is supplied to the second inlet and a second phase in which at least some compressed air from the first and second outlets is supplied to the tubing without passing through the other compressor,

said fluid flow control assembly including a passageway fluidly communicating said first outlet and said second inlet,

said fluid flow control assembly further including a first valve disposed along said passageway for controlling the flow of compressed air there through,

said first valve shiftable between an open position wherein compressed air can is permitted to flow through said passageway and a closed position wherein compressed air is prevented from flowing through said passageway.

63. (Currently Amended) ~~In a pneumatic conveyor as claimed in claim 61,~~ In a pneumatic conveyor including tubing and a power source, an improved centrifugal air compressing system comprising:

a first compressor drivingly connected to the power source for compressing air for the tubing,

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

said first compressor including a first inlet, a spaced first outlet, and a first impeller fluidly between the first inlet and first outlet to compress air;

a second compressor drivingly connected to the power source for compressing air for the tubing,

said second compressor including a second inlet, a spaced second outlet, and a second impeller fluidly between the second inlet and second outlet to compress air; and

a fluid flow control assembly fluidly intercommunicating the compressors so that the compressors cooperatively provide compressed air to the tubing in a number of operating phases, including a first phase in which at least some compressed air from the first outlet is supplied to the second inlet and a second phase in which at least some compressed air from the first and second outlets is supplied to the tubing without passing through the other compressor,

said fluid flow control assembly including a passageway fluidly communicating said first outlet and said second inlet,

said fluid flow control assembly further including a first valve disposed along said passageway for controlling the flow of compressed air there through,

said fluid flow control assembly including an additional passageway in fluid communication with said first outlet and the tubing,

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

said fluid flow control assembly further including a second valve disposed along said additional passageway downstream of said first-mentioned passageway for controlling the flow of compressed air through said additional passageway.

64. (Currently Amended) In a pneumatic conveyor as claimed in claim 63, said second valve shiftable between an open position wherein compressed air ~~can~~ is permitted to flow through said additional passageway and a closed position wherein compressed air is prevented from flowing through said additional passageway.

65. (Original) In a pneumatic conveyor as claimed in claim 63, said fluid flow control assembly including a second additional passageway in fluid communication with said second inlet, said fluid flow control assembly further including a third valve disposed along said second additional passageway upstream of said first-mentioned passageway for controlling the flow of air through said second additional passageway.

66. (Currently Amended) In a pneumatic conveyor as claimed in claim 65, said third valve shiftable between an open position wherein air ~~can~~ is permitted to flow through said second additional passageway and a closed position wherein air is prevented from flowing through said second additional passageway.

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

67. (Original) In a pneumatic conveyor as claimed in claim 65; and
a case presenting a compression chamber and a transmission chamber,
said first and second compressors and said fluid flow control assembly being at least partially
housed within said compression chamber,
said compression chamber presenting a case inlet in fluid communication with the
atmosphere.

68. (Original) In a pneumatic conveyor as claimed in claim 67,
said fluid flow control assembly including a third additional passageway fluidly
communicating the case inlet with said first inlet and fluidly communicating the case
inlet with said second additional passageway,
said fluid flow control assembly further including a fourth valve disposed along said third
additional passageway for controlling the flow of air there through.

69. (Currently Amended) In a pneumatic conveyor as claimed in claim 68,
said fourth valve shiftable between an open position wherein air ~~can~~ is permitted to flow
through said third additional passageway and a partially closed position wherein at
least some air is prevented from flowing through said third additional passageway.

Please add new claims 70-72 as follows:

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

70. (New) A multiphase compressing air assembly for supplying compressed air to a pneumatic conveyor, wherein the conveyor includes tubing and a power source shaft, said assembly comprising:

a first centrifugal compressor drivingly connectable to the power source shaft and operable to compress air for the tubing,

said first centrifugal compressor including a first inlet, a spaced first outlet, and a first impeller fluidly between the first inlet and first outlet to compress air;

a second centrifugal compressor drivingly connectable to the power source shaft and operable to compress air for the tubing,

said second centrifugal compressor including a second inlet, a spaced second outlet, and a second impeller fluidly between the second inlet and second outlet to compress air;
and

a fluid flow control assembly fluidly intercommunicating the centrifugal compressors wherein the centrifugal compressors cooperatively provide compressed air to the tubing in a number of operating phases, including a first phase in which at least some compressed air from the first and second outlets is supplied to the tubing without passing through the other centrifugal compressor and a second phase in which at least some compressed air from the first outlet is supplied to the second inlet,

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

said fluid flow control assembly being configured to switch from the first phase to the second phase in response to an increase in pressure in the tubing downstream of the first and second centrifugal compressors.

71. (New) A method of supplying compressed air to a pneumatic conveyor, wherein the conveyor includes tubing and a power source shaft, said method comprising the steps of:

- (a) driving a first centrifugal compressor by the power source shaft to compress air;
- (b) driving a second centrifugal compressor by the power source shaft to compress air;
- (c) operating the centrifugal compressors at least partially in series so that at least some air that is compressed by the first centrifugal compressor is further compressed by the second centrifugal compressor and then supplied to the tubing; and
- (d) operating the centrifugal compressors at least partially in parallel so that at least a portion of air is compressed by the first centrifugal compressor and at least another portion of air is compressed by the second centrifugal compressor and the at least a portion and at least another portion of compressed air are supplied to the tubing without passing through the other centrifugal compressor,

said operating step of (c) being performed after said operating step of (d) so that operation of the centrifugal compressors phases from at least partially in parallel to at least partially in series in response to an increase in pressure in the tubing downstream from the first and second centrifugal compressors.

Appl. No. 10/710,939

Amdt. dated November 17, 2005

Reply to Office Action of October 20, 2005

72. (New) In a pneumatic conveyor including tubing and a power source shaft, an improved centrifugal air compressing system comprising:

a first centrifugal compressor drivingly connected to the power source shaft for compressing air for the tubing,

said first centrifugal compressor including a first inlet, a spaced first outlet, and a first impeller fluidly between the first inlet and first outlet to compress air;

a second centrifugal compressor drivingly connected to the power source shaft for compressing air for the tubing,

said second centrifugal compressor including a second inlet, a spaced second outlet, and a second impeller fluidly between the second inlet and second outlet to compress air;
and

a fluid flow control assembly fluidly intercommunicating the centrifugal compressors wherein the centrifugal compressors cooperatively provide compressed air to the tubing in a number of operating phases, including a first phase in which at least some compressed air from the first and second outlets is supplied to the tubing without passing through the other centrifugal compressor and a second phase in which at least some compressed air from the first outlet is supplied to the second inlet,

said fluid flow control assembly switching from the first phase to the second phase in response to an increase in pressure in the tubing downstream of the first and second centrifugal compressors.